

1 48. (original) The method as defined in claim 47 wherein said step of generating a motion
2 metric value includes a step of generating said motion metric value in accordance with
3 $\Delta = \max(\Delta_e, \Delta_n)$, where Δ is said motion metric value.

1 49. (original) The method as defined in claim 46 wherein said step of obtaining luminance
2 value differences includes a step of generating a first luminance difference value in
3 accordance with $\Delta_e = |C_1 - C_{-1}|$, where C_{-1} is a luminance value of a pixel corresponding to
4 the missing pixel in the last prior field f_{-1} relative to a field f_0 including the missing pixel
5 and C_1 is a luminance value of a pixel corresponding to the missing pixel in field f_1 , a step
6 of generating a second luminance difference value in accordance with $\Delta_n = |N_0 - N_{-2}|$, where
7 N_0 is a luminance value of a pixel above of and in the same field f_0 as the missing pixel and
8 N_{-2} is a luminance value of a pixel above of the missing pixel and in the second prior field
9 f_{-2} relative to the field f_0 including the missing pixel, and a step of generating at least a
10 third luminance difference value in accordance with $\Delta_s = |S_0 - S_{-2}|$, where S_0 is a luminance
11 value of a pixel below of and in the same field f_0 as the missing pixel and S_{-2} is a
12 luminance value of a pixel below of the missing pixel and in the second prior field f_{-2}
13 relative to the field f_0 including the missing pixel.

1 50. (original) The method as defined in claim 49 wherein said step of generating a motion
2 metric value includes a step of generating said motion metric value in accordance with
3 $\Delta = \max(\Delta_e, \min(\Delta_n, \Delta_s))$, where Δ is said motion metric value.

Remarks

Claims 1, 2, 4-18, 20-27, 29-43 and 45-50 are pending in the application.

The drawings were objected to under 37 C.F.R. 1.84(a) for failing to comply with 37 CFR 1.84(p)(5) because they include reference characters not mentioned in the description.

Claim 4 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 29 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1-2, 4-8, 20-27, 29-43 and 45-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. patent 4,989,090 issued to Campbell on January 29, 1991 in view of

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U.S. Patent 6,037,986 issued to Kawada on December 16, 1997 and U.S. Patent 6,037,986 issued to Zhang on March 14, 2000.

Each of the various rejections and objections are overcome by amendments that are made to the specification, drawing, and/or claims, as well as, or in the alternative, by various arguments that are presented.

Any amendments to any claim for reasons other than as expressly recited herein as being for the purpose of distinguishing such claim from known prior art are not being made with an intent to change in any way the literal scope of such claims or the range of equivalents for such claims. They are being made simply to present language that is better in conformance with the form requirements of Title 35 of the United States Code or is simply clearer and easier to understand than the originally presented language. Any amendments to any claim expressly made in order to distinguish such claim from known prior art are being made only with an intent to change the literal scope of such claim in the most minimal way, i.e., to just avoid the prior art in a way that leaves the claim novel and not obvious in view of the cited prior art, and no equivalent of any subject matter remaining in the claim is intended to be surrendered.

Also, since a dependent claim inherently includes the recitations of the claim or chain of claims from which it depends, it is submitted that the scope and content of any dependent claims that have been herein rewritten in independent form is exactly the same as the scope and content of those claims prior to having been rewritten in independent form. That is, although by convention such rewritten claims are labeled herein as having been "amended," it is submitted that only the format, and not the content, of these claims has been changed. This is true whether a dependent claim has been rewritten to expressly include the limitations of those claims on which it formerly depended or whether an independent claim has been rewritten to include the limitations of claims that previously depended from it. Thus, by such rewriting no equivalent of any subject matter of the original dependent claim is intended to be surrendered. If the Examiner is of a different view, he is respectfully requested to so indicate.

Objection to the Drawing

The drawings were objected to under 37 C.F.R. 1.84(p)(5) because they include reference characters not mentioned in the description.

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An amendment has been presented to the specification to overcome the objection to the drawings. Specifically, figure legend 100 has been introduced at Page 3 to properly identify the de-interlacer presented in FIG. 1. Notice is given that the Examiner also indicated that figure legends "405" and "406" were not mentioned in the description. Applicant respectfully submits that such figure legends may be found in the originally filed specification at Page 7, lines 11 and 13 respectively that discuss the various sorting operations occurring in FIG. 4. Accordingly, no amendments to the specification are deemed necessary with respect to these figure legends.

As such, Applicants respectfully request that the Examiner's objection be withdrawn.

Rejection Under 35 U.S.C. 112, Second Paragraph

Claims 4 and 29 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The Office Action states that there is insufficient antecedent basis for the limitation "apparatus as defined in claim 3" in line 1 of claim 4, and there is insufficient antecedent basis for the limitation "method as defined in claim 28" in line 1 of claim 29.

Applicants respectfully avoid this ground of rejection for the following reasons.

Applicants have amended claim 4 so as to be directly dependent upon claim 1 and have amended claim 29 so as to be directly dependent upon claim 26. The originally filed claims 3 and 28 were directly dependent upon independent claims 1 and 26 respectively and their features were subsequently incorporated into such independent claims earlier in the prosecution history. Accordingly, the current amendments to claims 4 and 29 restore the antecedent basis intended by the Applicants.

Therefore, Applicants' claims are allowable under 35 U.S.C. 112, second paragraph.

Rejection Under 35 U.S.C. 103(a)

Claims 1-2, 4-8, 20-27, 29-43 and 45-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. patent 4,989,090 issued to Campbell on January 29, 1991 in view of U.S. Patent 6,037,986 issued to Kawada on December 16, 1997 and U.S. Patent 6,037,986 issued to Zhang on March 14, 2000.

Applicant respectfully avoids this ground of rejection for the following reasons.

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While the Examiner has moved away from his earlier use of the term "motion metric" during the formulation of this latest rejection, his attempt at using the more encompassing terminology of "motion value(s)" cannot be applied as broadly as is written. As discussed in Applicants previous response, Campbell operates directly upon pixels to arrive at its "motion value" as now identified by the Examiner. This is also seen in Col. 7, lines 51-60 of Campbell which presents a "pixel difference value" with its sign eliminated to define a representative motion. Although the Examiner had cited Col. 7, lines 53-55 to show "motion values" in the art, such "motion values" are not "motion metric values" as claimed and described in the invention. Additionally, Applicants have also previously discussed that Kawada operates upon the well-known and understood concept of motion vectors. This can be seen in the first paragraph of the Summary of the Invention section that bridges Cols. 1 and 2 of Kawada as well as Col. 3, lines 9-17 of this reference. Although the Examiner had cited Col. 3, lines 6-9 to show at least three "motion values" in the art, such "motion values" are the well-know motion vectors and not "motion metric values" as claimed and described in the invention.

Applicants' review of the new reference Zhang (used to allegedly introduce motion metrics) indicates that there is nothing disclosed or suggested that improves upon the combination of Campbell and Kawada to yield the subject invention. Specifically, a motion metric value $c(i,j)$ as defined by Zhang is discussed in detail at Col. 7, lines 16-34 as being a summation of first and second BMI bitmap values for 21 neighboring pels about a given pel(i,j). Such disclosure is once again clearly not that which is presented and claimed in the subject invention as a motion metric. As presented in Applicants' prior Response, the Applicants' motion metric (identified as Δ) is introduced at Page 4, line 18 of the Specification and further defined at Page 4, lines 25-27. Specifically, "(t)he motion metric Δ at a missing pixel may be defined by employing some combination of the obtained pixel luminance value differences, for example, by $\Delta = \max(\Delta c, \Delta a)$." Additionally, the motion metric Δ can be expressed in a number of other ways as detailed as described Page 5 of the Specification. It is respectfully submitted that the mere use of the phrase "motion metric" by Zhang is insufficient to attempt to apply such language to the combination of Campbell and Kawada to arrive at the subject invention. That is, in each instance of a cited reference, a different aspect of video processing is presented or a different starting point is used to arrive

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at some type of motion detection parameter than that which is claimed. Accordingly, a combination of these three very different strategies results in a device that does not read upon the claims.

The Examiner states that Campbell and Kawada are combinable because they are from the same field of endeavor and that it would have been obvious to apply the spatial median filter for generating median motion values of Kawada to the motion value calculation and processing of Campbell to provide for satisfactory visual interpolation. Further, the Examiner states Zhang is combinable with Campbell and Kawada because they are from the same field of endeavor and that it would have been obvious to detect motion by specifically using motion metric values as the motion values. These conclusions cannot be sustained because of the different parameters that Campbell, Kawada and Zhang operate upon. As presented above and earlier in the prosecution history, operations upon pixels to arrive at the "motion value" of Campbell are distinctly different from the operations upon the motion vectors to arrive at the median "motion value" of Kawada. Further, these two operations are distinctly different from the bitmap summation operations of Zhang to arrive at the motion metric values disclosed in this newly cited reference. The teachings of Campbell, Kawada and Zhang are very clear as to how and upon what video elements motion is detected and accounted for and any attempted combination of these references would result in generation of motion values based upon a combination of pixels and vectors and bitmap summations and not the median motion metric value as claimed. Further, none of Campbell, Kawada or Zhang teach or suggest that it is possible to "replace" one type of processing (i.e., vector processing) with another type of processing (i.e., pixel processing) such that one skilled in the art would apply the teachings in such a combination. That is, the Examiner-offered combination of disparate forms of video post-processing would not perform in the intended manner to achieve the desired results and cannot possibly function in the manner intended.

As such, Applicants maintain the position that there is a different definition and interpretation of the claimed "motion metric" element over what the Examiner has cited in the references (i.e., either ordinary pixel processing, motion vectors or bitmap value summations) or otherwise known in the art. It is submitted that one reading the claims in conjunction with the supporting specification can easily identify such differences and such consideration must be given. In each instance of the independent claims, it is respectfully

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submitted that the combined teachings of Campbell in view of Kawada and Zhang do not teach or suggest motion metrics and performing operations on same as claimed; thus, a gap still exists in the combined teachings of the references. Therefore, Applicants' claims 1-2, 4-8, 20-27, 29-43 and 45-50 are allowable over Campbell in view of Kawada and Zhang under 35 U.S.C. 103(a).

CONCLUSION

Thus, Applicants submit that all claims now pending are in condition for allowance. Accordingly, both reconsideration of this application and its swift passage to issue are earnestly solicited.

If, however, the Examiner believes that there are any unresolved issues requiring adverse final action in any of the claims now pending in the application, it is requested that the Examiner telephone Eamon J. Wall at (732) 530-9404 so that appropriate arrangements can be made for resolving such issues as expeditiously as possible.

In the event that an extension of time is required for this amendment to be considered timely, and a petition therefor does not otherwise accompany this amendment, any necessary extension of time is hereby petitioned for, and the Commissioner is authorized to charge the appropriate cost of such petition to counsel's Deposit Account No. 20-0782/LCNT/124969.

Respectfully submitted,

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